

REMARKS

Status of the claims:

Claims 1-4, 8-11, 15 and 16 are pending and ready for further action on the merits. Reconsideration is respectfully requested in light of the following remarks.

Rejections under 35 USC §103

Claims 1, 2, 8-11, 15, and 16 have been rejected under 35 USC §103(a) as being unpatentable over Apelian '943 (US Patent No. 5,062,943).

Claims 3 and 4 have been rejected under 35 USC §103(a) as being unpatentable over Apelian '943 in view of FR '951 (FR 2,668,951).

These rejections are traversed for the following reasons.

Present Invention

The present invention relates to a method of hydrocracking hydrocarbon oils. The method as recited in claim 1 comprises the steps of: pre-contacting a hydrocracking catalyst with a solution containing an organic nitrogen compound in a range of 10 ppm to 100 ppm by nitrogen weight, then contacting a feed oil substantially comprised of hydrocarbon oils and hydrogen with the hydrocracking catalyst that has been contacted with the

organic nitrogen compound in order to obtain a hydrocarbon oil with a lower boiling point than that of the feed oil. The concentration of nitrogen in the feed oil is not more than 10 ppm. The organic nitrogen compound is an organic nitrogen compound having a boiling point that is lower than a 50% distillation temperature of the feed oil and is higher than 200°C. As a result of contacting the petroleum fraction as claimed in claim 2 or the organic nitrogen compound as claimed in claim 1 with the hydrocracking catalyst, the hydrocracking catalyst contains 0.01% to 1% by nitrogen weight of the organic nitrogen compound per catalyst weight.

Disclosure of Apelian '943

Apelian '943 discloses that the equilibration of a zeolitic hydrocracking catalyst is accelerated by the addition of nitrogen compounds to the hydrocracker feed during the start of cycle (SOC). Apelian '943 further discloses that the addition of nitrogen compounds reduces the exotherm, and is indicative of a decrease in the hydrogenation activity of the catalyst consequent upon the addition of the nitrogen. The reduced hydrogenation level decreases hydrogen consumption at this point in the cycle so that units that are hydrogen constrained may be operated under more favorable conditions. In addition, Apelian '943 discloses that the attainment of equilibrium or lineout

conditions is accelerated and yield benefits, particularly in the production of middle distillates are observed.

Disclosure of FR '951

FR '951 discloses a process for the activation of a hydrocracking catalyst, wherein the catalyst is activated with sulfur and with nitrogen in the hydrocracking zone in the presence of a light petroleum fraction containing sulfur and nitrogen. The process optionally contains additional sulfur and nitrogen compounds. The sulfur and nitrogen content of the petroleum fraction and of the additional compounds varies depending on whether the catalyst is intended to be pre-sulfurized in the hydrocracking zone (in situ) or outside the hydrocracking zone (ex situ).

Removal of the Rejections over Apelian '943 as well as Apelian '943 in view of FR '951

At page 3, lines 9-11 of the Office Action of March 31, 2003, regarding Apelian '943, the Examiner asserts that the contacting of the catalyst with a nitrogen-containing compound would result in the nitrogen compound being adsorbed onto the catalyst in amounts within the claimed range. Applicants disagree.

Applicants believe that in Apelian '943, ammonia, rather than an organic nitrogen compound is adsorbed onto the catalyst for the following reasons. The table in column 6 and the explanation of the table in column 6 in Apelian '943 show that the ammonia level is remarkably changed depending on H_2 consumption, and tertiary-butylamine is added as a dopant for the ammonia. Please see column 6, lines 17-28 in Apelian '943. The feed nitrogen shown in the table in column 6 is considered to be nitrogen contained in feed oil, because the ammonia level is significantly higher than the feed nitrogen level shown in the table in column 6. Accordingly, it would be apparent to one of ordinary skill in the art that the ammonia level shown in the table in column 6 is an amount of ammonia that is produced from the decomposition of tertiary-butylamine.

Moreover, in Apelian '943, ammonia is the first exemplified nitrogen compound, and subsequently various other nitrogen compounds are listed as described at column 4, lines 47-61 in Apelian '943. Among the nitrogen compounds disclosed are quinoline (BP $238^{\circ}C$), pyridine ($115^{\circ}C$), and tertiary butylamine (BP $44^{\circ}C$). Applicants respectfully point out that only quinoline has a boiling point above $200^{\circ}C$. Thus, Applicants submit that Apelian '943 does not suggest that using an organic nitrogen compound with a boiling point of greater than $200^{\circ}C$ will give the superior results of the instant invention.

The tertiary butyl amine that is used in the example in Apelian '943 is mostly decomposed into ammonia in the presence of hydrogen for hydrocracking as indicated by the ammonia level in the table in column 6 of Apelian '943 (and as described above). In other words, Apelian '943 presumes that the nitrogen compounds are decomposed to ammonia. It is this ammonia, which comes into contact with the catalyst (and not other organic nitrogen containing compounds).

Further, Applicants respectfully submit that the range of 1 ppmw to 1.0 weight percent disclosed in Apelian '943 is an amount of nitrogen-containing compound in the feedstock and not in the catalyst. Thus, Apelian '943 does not meet this claimed element. Apelian '943 also does not clearly teach whether the nitrogen-containing compound contained in the feedstock is an organic nitrogen compound or ammonia. Even though the nitrogen-containing compound is an organic nitrogen compound, the compound is likely to be decomposed to ammonia in Apelian '943 as described above.

Accordingly, when the nitrogen compound is adsorbed onto a catalyst, the nitrogen compound is ammonia rather than an organic nitrogen compound having a boiling point of not less than 200°C as recited in claim 1 of the instant invention.

Because the invention uses an organic nitrogen compound having a boiling point of not less than 200°C, the organic

nitrogen compound is not decomposed to ammonia, so that the initial deactivation rate of not more than 0.5°C/month can be achieved as demonstrated in example 1 in this application. In contrast, the initial deactivation rate in Apelian '943 is 1-20°F/month which corresponds to 17-330°C/month (0.5-11°C/day). Please note that this rate is similar to the range disclosed for the comparative example in the instant written description (2°C/day). This means that the disclosure of Apelian '943 is inferior to the instant invention (or similar to those of the comparative example). Accordingly, one of ordinary skill in the art would see that the instant invention possesses unexpectedly superior properties to the disclosure of Apelian '943. FR '951 fails to make up the deficiencies of Apelian '943. In other words, the rejections over Apelian '943 and over Apelian '943 in view of FR '951 are inapposite. Withdrawal of the rejections is warranted and respectfully requested.

With the above remarks, it is believed that the claims, as they now stand, define patentable subject matter such that passage of the instant invention to allowance is warranted. A Notice to that effect is earnestly solicited.

If any questions remain regarding the above matters, please contact Applicant's representative, T. Benjamin Schroeder (Reg. No. 50,990), in the Washington metropolitan area at the phone number listed below.

Pursuant to the provisions of 37 C.F.R. §§ 1.17 and 1.136(a), Applicants respectfully petitions for one (1) month extension of time for filing a response in connection with the present application. The required fee of \$110.00 is attached hereto.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By 

Marc S. Weiner, #32,181

P.O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000

BS
MSW/TBS/mua